Alternative Disinfection Considerations
Drinking Water Treatment

Chlorine Gas	
Advantages	*Potential Disadvantages*
Inexpensive	Cost is increasing
Tradition	Forms regulated DBPs
	Operator safety
	Transportation risk
	Public safety
	Needs scrubber system
Bulk Liquid Hypochlorite	
Advantages	*Potential Disadvantages*
Easy to use	Decays with light exposure and temperature
Supply readily available	Scaling of piping and feed system creates routine maintenance
Eliminates process safety management required by gas chlorine – reducing staff time	Trace contaminants (bromate)
	Requires bulk and day tanks for storage
	Chemical and maintenance costs greater than gas chlorine
On-site Generated Hypochlorite	
Advantages	*Potential Disadvantages*
Easy to use	Generates hydrogen gas which must be vented
Production chemicals readily available	More maintenance intensive than bulk hypochlorite
Eliminates process safety management required by gas chlorine – reducing staff time	Chemical and maintenance costs greater than liquid hypochlorite
No bulk storage needed	Significant capital costs
Avoids truck shipments of hazardous chemical	

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UV	
Advantages	*Potential Disadvantages*
Small footprint	Water distribution systems still require chlorine residual
Reduced dependence on chemicals and truck shipments	Validation procedures for CT credit in water treatment not finalized
Provides additional log removal credit for water plants needing additional Cryptosporidium protection	Electrical cost
Easy to use	Lamp replacement cost
Ozone	
Advantages	*Potential Disadvantages*
Taste and odor control in addition to disinfection	Capital expense
May reduce regulated DBPs	Cost of O&M
Ability to meet CT for water treatment	Complexity of O&M
Oxidation of wide range of compounds	New regulated DBPs (Bromate)
Combined Chlorine (with bulk or on-site generated hypochlorite)	
Advantages	*Potential Disadvantages*
Easy to use	Nitrification
Inexpensive	Fish owners and dialysis unit notification needed
Reduces regulated DBPs	Potential new unregulated DBPs
Eliminates taste and odor of free chlorine	
Chlorine Dioxide	
Advantages	*Potential Disadvantages*
Easy to use	Hazardous chemicals
Reduces regulated DBPs	New regulated DBPs formed

Alternative Disinfection Considerations
Wastewater Treatment

Chlorine Gas	
Advantages	*Potential Disadvantages*
Inexpensive	Cost is increasing
Tradition	Need to dechlorinate discharge
	Operator safety
	Transportation risk
	Public safety
	Needs scrubber system
Bulk Liquid Hypochlorite	
Advantages	*Potential Disadvantages*
Easy to use	Decays with light exposure and temperature
Supply readily available	Scaling of piping and feed system creates routine maintenance
Eliminates process safety management required by gas chlorine – reducing staff time	Requires bulk and day tanks for storage
	Chemical and maintenance costs greater than gas chlorine
On-site Generated Hypochlorite	
Advantages	*Potential Disadvantages*
Easy to use	Generates hydrogen gas which must be vented
Production chemicals readily available	More maintenance intensive than bulk hypochlorite
Eliminates process safety management required by gas chlorine – reducing staff time	Chemical and maintenance costs greater than liquid hypochlorite
No bulk storage needed	Significant capital costs
Avoids truck shipments of hazardous chemical	
UV	
Advantages	*Potential Disadvantages*
Small footprint	Not effective if turbidity present
Reduced dependence on chemicals and truck shipments	Electrical cost
Easy to use	Lamp replacement cost
Eliminates dechlorination feed system	

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